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09/895,517	06/28/2001	Ralf Wolleschensky	GK-ZEI-3099/500343.20099	8222

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EXAMINER	
PRITCHETT, JOSHUA L	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/895,517	Applicant(s) WOLLESCHENSKY ET AL.	
	Examiner Joshua L Pritchett	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-90* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-90* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in response to the Request for Continued Examination filed November 4, 2003. Claims 1-8 and 48 have been added and claims 87-90 have been added as requested by applicant.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Regarding claims 1-47 and 87-89, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claims 48-86 and 90 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 48 and 90, the claim language fails to clearly define the limitations of the claim as to which type of wavelength dependent behavior is examined by the claimed method. The remaining claims depend from claim 48 and inherit the deficiencies thereof.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 20, 21, 24, 25, 48, 52, 62, 63, 66 and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeffers (US 5,486,915).

Regarding claims 1 and 48, Jeffers discloses a method for optical detection of characteristic quantities of the wavelength-dependent behavior (abstract lines 2-3) of an illuminated specimen (abstract lines 1-2), such as the emission behavior or absorption behavior, preferably the fluorescence (abstract lines 4-5) or luminescence or phosphorescence or enzyme-active light emission or enzyme-active fluorescence by determining at least one centroid (abstract lines 7-8). Jeffers discloses in the abstract that using a "selected wavelength" of light excites the sample, in this case wood pulp. Jeffers further discloses that the "fluorescence emission" from the sample is determined and the concentration of a particular compound in the sample is calculated based on either the centroid method or a band ratio method.

Regarding claims 7 and 52, Jeffers further teaches spectral weighting carried out between a plurality of detection channels, summing of the weighted channels of the signals of the detection and summing the detection channels (col. 5 lines 55; Eq. 2).

Regarding claims 20 and 62, Jeffers further teaches the use of color-coded fluorescence imaging (col. 3 line 67).

Regarding claims 21 and 63, Jeffers further teaches the superposition of additional images (Fig. 1). Fig. 1 shows several graph lines superimposed onto one set of axes.

Regarding claims 24 and 66, Jeffers further teaches a comparison of the measured signal to a reference carried out by comparators in detection channels and in case the reference signal is not reached or is exceeded a change in the operating mode of the detection channel occurs (140). Element 140 of Jeffers is a control element which inherently receives a detection signal and compares it to a reference signal to determine how to modify the production process.

Regarding claims 25 and 67, Jeffers teaches that respective detection channel is switched off or not taken into account (140). Element 140 of Jeffers is a control element which inherently shuts off control when the reference signal is matched by the detection signal within acceptable error.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-3, 10, 14, 26, 32, 42, 45, 55, 66, 74 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Yang.

Regarding claims 2 and 3, Jeffers teaches the invention as claimed including using the centroid to determine the concentration of a component of a composition but lacks specific reference to the use of the centroid detection to determine the amount of dye in a composition. Yang teaches the emission radiation of fluorochromes is carried out for distinguishing different dyes and/or determine the local dye composition of an image point when a plurality of dyes are used simultaneously or determine the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached and/or for measuring emission ratio dyes for determining ion concentration (col. 3 lines 32-35). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention determine the dye concentration of a composition as taught by Yang for the purpose of determining if any hazardous components existed within the tested composition.

Regarding claims 10 and 55, Jeffers teaches the invention as claimed but lacks reference to converting the signal to a digital signal. Yang teaches signal detection conversion to digital and reading out of the converted signal and the weighting and summing carried out digitally in a computer (col. 6 lines 15-23, col. 17 lines 26-28). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention convert the signal into a digital signal as taught by Yang for the purpose of more easily viewing the collected results.

Regarding claim 14, Jeffers teaches the invention as claimed but lacks reference to nonlinear distortion of the signal. Yang teaches the signals of the detector channels are

influenced by nonlinear distortion of the input signals (col. 26 line 1). In this case experimental noise is taken to mean the same thing as nonlinear distortion. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers signal influenced by nonlinear distortion as taught by Yang of the purpose of accounting for experimental noise in the collected results.

Regarding claims 26 and 68, Jeffers teaches the invention as claimed but lacks reference to narrowing the spectral region. Yang teaches the relevant spectral region is narrowed (col. 25 lines 7-8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention narrow the spectral region as taught by Yang for the purpose of targeting a specific material or wavelength during process monitoring.

Regarding claims 32 and 74, Jeffers teaches the invention as claimed but lacks a microscope. Yang teaches the use of the spectral detection in a microscope (col. 25 line 7). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention include a microscope as taught by Yang for the purpose of viewing small variations in the emission pattern of the tested sample.

Regarding claims 42, 45 and 83, Jeffers teaches the invention as claimed but lacks reference to brightfield imaging. Yang teaches the use of brightfield imaging (col. 6 lines 5-6). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention use brightfield imaging for the purpose of easily viewing the results from the collected data.

Regarding claims 43 and 84, Jeffers teaches the invention as claimed but lacks reference to point imaging. Yang teaches the use of point imaging (col. 3 line 39). It would have been

obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention use point imaging as taught by Yang for the purpose of viewing small variations in the emission pattern of the tested sample.

Claims 4-6, 8, 9, 13, 15, 17-19, 49-51, 53, 54 and 58-61are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Okubo.

Regarding claims 4-6 and 49-51, Jeffers teaches the invention as claimed, but lacks reference to the splitting of the emission radiation by a dispersive element. Okubo teaches the use of a dispersive element to split the emission radiation for the sample being examined (page 10 lines 31-33). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dispersive element to split the emission radiation entering the Jeffers invention for the purpose of sending the signal to several different detectors for data processing and analysis.

Regarding claims 8, 9, 13, 53, 54, and 58, Jeffers lacks the use of a weighting curve in the analysis of the data collected. Okubo teaches the use of both straight line and adjustable weighting curve during data analysis (page 7 lines 19-34). In this case the equations provided by Okubo are taken to be numerical representations of the equations that determine the weighting curve. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a weighting curve to analyze the data collected by the Jeffers invention for the purpose of quicker and more precise calculations through the use of a reference material.

Regarding claim 15 and 16, Jeffers further lacks the influence of experimental noise on integration parameters and amplification during the data analysis process. Okubo teaches that the integration parameters and amplification are adjustable based on the signal input (page 7 lines 19-34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the integration parameters and the amplification of the signal adjustable for the purpose of collecting more precise results from the experimentation through the elimination of experimental noise.

Regarding claims 17 and 59, Jeffers does teach the conversion of the signal from analog to digital (col. 25 lines 35-36).

Regarding claims 18 and 60, Jeffers further lacks the weighting of the signals from the individual channels through the use of weight curves. Okubo teaches the use of weight curves and the application of weight curves in summing the results from different channels (page 7 lines 19-34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a weighting curve to analyze the data collected by the Jeffers invention for the purpose of more precise and reliable calculations.

Regarding claims 19 and 61, Jeffers also teaches the sum signal generating an image (col. 25 lines 29-30).

Claims 11, 12, 27, 56, 57, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Lee.

Regarding claims 11 and 56 Jeffers teaches the invention as claimed but lacks the dimension of analog processing through the use of resistance cascade. Lee teaches the use of

resistors in combination as a means of processing the collected data (col. 10 lines 28-34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use resistors in combination as a data processing means within the Jeffers invention for the purpose of sorting the intensity of the light emission by the amount of electricity created by the photons contacting the detector.

Regarding claims 12 and 57 Jeffers further lacks adjustable resistance within the resistors used to process the data collected. Lee teaches the use of adjustable resistors (col. 10 line 34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use adjustable resistors for the purpose of increased flexibility in the application of the Jeffers invention.

Regarding claims 27 and 69 Jeffers further lacks signals of detection channels being generated by an integrator circuit. Lee teaches the use of an integration circuit to generate the signal of a detection channel (col. 10 lines 28-34). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an integrator circuit in the generation of the signals from the Jeffers invention for the purpose of quick and reliable conversion of the light intensity to an electronic signal usable by a computer.

Claims 22, 23, 64 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Okubo as applied to claims 8 and 53 above, and further in view of Hochman.

Jeffers in view of Okubo teaches the invention as claimed but lacks the use of either a weighting curve or a lookup table. Hochman teaches the use of a lookup table for use in combination with position and sum signals as well as in the representation of different dyes

and/or the spread of the generated image (col. 12 lines 12-15). It would have been obvious to a person of ordinary art at the time the invention was made to use a lookup table as described in Hochman in combination with the Jeffers in view of Okubo invention for the purpose of making the generated images easier to understand and to increase the speed of data analysis.

Claims 28-30, 34, 70-72, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Kash.

Regarding claims 28 and 70 Jeffers teaches the invention as claimed but lacks a specific reference to photon counting. Kash teaches the use of photon counting as a means to determine the intensity of light emitted from a sample (col. 7 lines 46-48). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a photon detector as a means of collecting the emission intensity for the Jeffers invention because the use of a photon detector is commonly known in the art.

Regarding claims 29 and 71 Jeffers further lacks photon counting carried out in a time relation. Jeffers does teach a time dependent relationship within the invention (col. 5 lines 36-37). Kash teaches the use of time related photon counting (col. 3 lines 5-20). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use time related photon counting in the Jeffers invention for the purpose of measuring how the emissions of the sample change with respect to time.

Regarding claims 30, 34, 72, and 76, Jeffers further lacks the specific mention of the detection of single photons or multiphoton fluorescence. Kash teaches the detection of multiphoton fluorescence (col. 6 lines 47-48). It would have been obvious to a person of

ordinary skill in the art at the time the invention was made to use single or multiphoton fluorescence detection within the Jeffers invention for the purpose of collecting data related to the intensity of the emission of the sample being examined.

Claims 35, 39, 41, 44, 46, 77, 81, 82, 85, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Simon.

Regarding claims 25, 39, 46, 77, 81 and 86, Jeffers teaches the invention as claimed but lacks reference to either confocal or nonconfocal detection. Simon teaches the use of both confocal and nonconfocal detection (col. 4 line 2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use either confocal or nonconfocal detection in combination with the Jeffers invention for the purpose of focusing the emission of the sample to the appropriate location of a detector.

Regarding claims 41, 44, 82 and 85, Jeffers further lacks reference to either descanning or nondescanning detection. Simon teaches the use of either descanning or nondescanning detection (col. 3 lines 12-13). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use either descanning or nondescanning detection within the Jeffers invention for the purpose of determining the emission of the sample being tested.

Claims 33, 36, 37, 38, 40, 47, 75, 78, 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Yagi.

Regarding claims 33 and 75, Jeffers teaches the invention as claimed but lacks reference as to the method of scanning the sample during data collection. Yagi teaches a scanning

microscope (col. 2 lines 6-7). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a scanning microscope within the Jeffers invention for the purpose of collecting data from a wide spatial range within the test sample and to allow the ability to pinpoint a specific location within the sample.

Regarding claims 36, 40 and 78, Jeffers further lacks a scanning arrangement for the microscope. Yagi teaches a scanning arrangement (col. 4 lines 3-4). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the Jeffers invention with a scanning arrangement for the purpose of collecting data from a wide spatial range within the test sample and to allow the ability to pinpoint a specific location within the sample.

Regarding claims 37, 38, 47, 79, and 80, Jeffers further lacks reference to either an X-Y scanning table or illumination means for a scanning means. Yagi teaches the use of an X-Y scan table (col. 4 lines 3-4). Yagi further teaches a means of illumination for the X-Y scanning means (col. 4 lines 1-2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the Jeffers invention with an X-Y scanning table and a means of illumination for the X-Y scanning means for the purpose of collecting data from a wide spatial range within the test sample and to allow the ability to pinpoint a specific location within the sample.

Claims 31 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Tuuanen.

Jeffers teaches the invention as claimed, but lacks reference to the placement of the sample on a microtiter plate. Tuuanen teaches the placement of a samples used in fluorescence microscopy on a microtiter plate (col. 2 lines 45-47). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to place the sample on a microtiter plate because this practice is widely known and used in the art.

Claims 87-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeffers in view of Yang and Okubo.

Jeffers discloses a method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen, such as the emission behavior and/or absorption behavior, preferably the fluorescence and/or luminescence and/or phosphorescence and/or enzyme-active light emission and/or enzyme-active fluorescence by determining at least one centroid (abstract lines 7-8). Jeffers lacks specific reference to the use of the centroid detection to determine the amount of dye in a composition. Yang teaches the emission radiation of fluorochromes is carried out for distinguishing different dyes and/or determine the local dye composition of an image point when a plurality of dyes are used simultaneously or determine the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached and/or for measuring emission ratio dyes for determining ion concentration (col. 3 lines 32-35). Jeffers lacks reference to the splitting of the emission radiation by a dispersive element and the use of a weighting curve. Okubo teaches the use of a dispersive element to split the emission radiation for the sample being examined (page 10 lines 31-33). Okubo teaches the use of both straight line and adjustable weighting

curve during data analysis (page 7 lines 19-34). In this case the equations provided by Okubo are taken to be numerical representations of the equations that determine the weighting curve. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Jeffers invention determine the dye concentration of a composition as taught by Yang for the purpose of determining if any hazardous components existed within the tested composition. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dispersive element to split the emission radiation entering the Jeffers invention for the purpose of sending the signal to several different detectors for data processing and analysis. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a weighting curve to analyze the data collected by the Jeffers invention for the purpose of quicker and more precise calculations through the use of a reference material.

Response to Arguments

Applicant's arguments, see Amendment B, filed October 3, 2003, with respect to the rejection(s)of claim(s) 1 and 48 under Yang have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Jeffers.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP

DREW DUNN
SUPERVISORY PATENT EXAMINER